

Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PROBLEMS AND SOLUTIONS.

EDITED BY B. F. FINKEL AND R. P. BAKER.

PROBLEMS FOR SOLUTION.

ALGEBRA.

When this issue was made up no solution of 420 had been received.

424. Proposed by S. A. JOFFE, New York City.

Sum the series

$$\binom{n}{a} - \binom{n-1}{a} \binom{i}{1} + \binom{n-2}{a} \binom{i}{2} - \binom{n-3}{a} \binom{i}{3} + \dots + (-1)^i \binom{n-i}{a},$$

and consider the cases i = a and i > a.

425. Proposed by CLIFFORD N. MILLS, Brookings, S. D.

Solve for x and y the equations: $2^{x+y} = 6$ and $2^{x+1} = 3^y$.

GEOMETRY.

When this issue was made up solutions had been received for numbers 370, 430, 432-3, 447-8, 450-1. Please give attention to 427, 442, 446, 449.

452. Proposed by NATHAN ALTSHILLER, University of Washington.

Through a given point a secant is drawn that meets three given concurrent lines in the points A, B, C respectively. Determine the position of the secant by the condition AB/BC = K, K being given.

453. Proposed by CLIFFORD N. MILLS, South Dakota Agricultural College.

Prove geometrically the formulæ for $\sin 2\beta$, $\cos 2\beta$, $\sin 3\beta$, $\cos 3\beta$.

454. Proposed by LOUIS ROUILLION, Mechanics Institute, New York City.

Show how to construct an equilateral triangle with its vertices lying on three lines not equally spaced.

CALCULUS.

When this issue was made up solutions had been received for numbers 358-9, 361-2, 364, 371, 373. Please give attention to 332, 339, 340, 342, 348, 353, 360, 363.

374. Proposed by C. N. SCHMALL, New York City.

Show that, on a Mercator's Chart, a great circle of a sphere whose radius is r will be represented by a curve whose equation is of the form

$$c(e^{y/r} - e^{-(y/r)}) = 2\sin\left(\frac{x}{r} + \theta\right).$$

(Note. See Eisenhart's Differential Geometry, § 46, pp. 107-108; Osgood's Calculus, pp. 331-333, § 6.)

375. Proposed by v. m. SPUNAR, Chicago, Illinois.

Solve the differential equation,

$$x^{2}(a - bx)\frac{d^{2}y}{dx^{2}} - 2x(2a - bx)\frac{dy}{dx} + 2(3a - bx)y = 6a^{2}.$$